Information Technology Planning and Assessment Guidelines

Effective: May 20, 1999

Table of Contents

Introduction

Information Services Board (ISB) policy requires that each agency establish and maintain an information technology (IT) portfolio that contains a summary of its current and proposed technology investments. The portfolio must include information about agency business and technology plans, investment priorities, current projects, and technology infrastructure.

This guide will help you prepare and manage your agency's technology portfolio. It describes the role planning plays in the portfolio management process; provides a practical approach to making technology investment decisions; and introduces tools to assist you in the process. Use of the concepts and tools presented are not mandated. Agencies may select other methods and processes to make technology investment decisions. But whatever methods or processes are selected, each agency must assure that decisions about proposed and continuing investments are based on rigorous analyses of organizational benefits, costs and risks.

Statutory Authority

The provisions of RCW 43.105.041 detail the powers and duties of the ISB, including the authority to develop statewide or interagency information services and technical policies, standards and procedures.

Scope

This policy applies to all executive and judicial branch agencies and educational institutions, as provided by law, that operate, manage, or use IT services or equipment to support critical state business functions.

Exemptions

None.

Guidelines

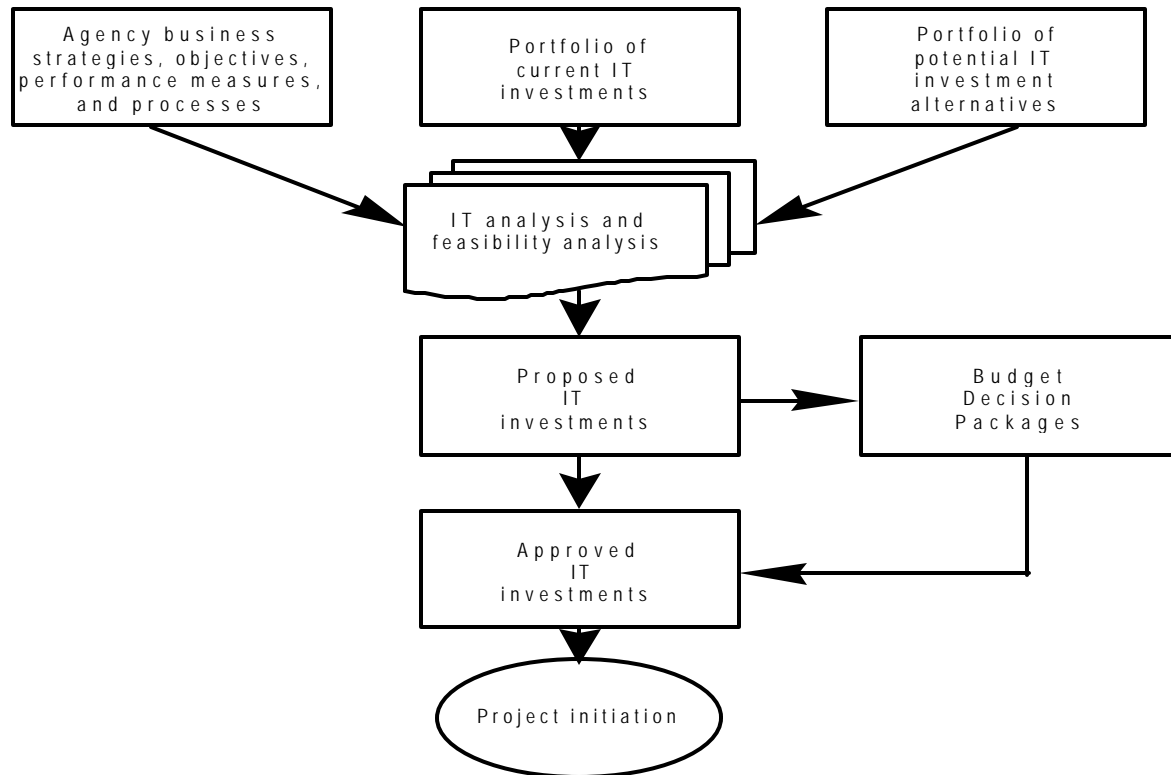### Elements of IT Portfolio Management

IT portfolio management provides an integrated approach to the identification, selection, control, evaluation, and life-cycle management of technology investments.

The process may be viewed as consisting of three interrelated components:

- Planning and Selecting Technology Investments — Making decisions based on agency strategies and business requirements regarding the selection, continuation, or cancellation of investments. Risk assessment approaches described in Section V of this document will help the agency consider proposed investments by choosing from a variety of different tools.
- Managing Established Investments — Making sure that once technology investment decisions are made, performance expectations are achieved, costs are kept within budgeted resources, and schedules are met.

Evaluating the Performance of Investments — Including baseline, ongoing, and new investment assessments.

Figure 1: IT Portfolio Management Process

```
┌────────────────────┐   ┌────────────────┐   ┌────────────────┐
│ Agency business    │   │ Portfolio of   │   │ Portfolio of   │
│ strategies,        │   │ current IT     │   │ potential IT   │
│ objectives,        │   │ investments    │   │ investment     │
│ performance        │   │                │   │ alternatives   │
│ measures, and      │   │                │   │                │
│ processes          │   │                │   │                │
└────────────────────┘   └────────────────┘   └────────────────┘
            ↘                   │                    ↙
                    ┌──────────────────────┐
                    │ IT analysis and      │
                    │ feasibility analysis │
                    └──────────────────────┘
                              │
                              ▼
              ┌──────────────────┐        ┌──────────────────┐
              │   Proposed IT    │ ─────▶ │   Budget         │
              │   investments    │        │   Decision       │
              └──────────────────┘        │   Packages       │
                        │                 └──────────────────┘
                        ▼                          │
              ┌──────────────────┐                 │
              │   Approved IT    │ ◀───────────────┘
              │   investments    │
              └──────────────────┘
                        │
                        ▼
                ( Project initiation )
```

Critical Success Factors

Successful portfolio planning includes the following practices:

- Agency executives are actively involved in the portfolio management process
- Portfolio decisions are linked to the agency's business plan and budget and are consistent with state and agency technology policies and standards
- Decisions are based on the best available cost, benefit and risk information
- Previous projects are reviewed to determine if the desired objectives were met (cost, schedule, quality, etc.)

Emphasis is on maximizing value to the agency and the state while managing risk. Portfolio management helps decision-makers determine the real value of technology to the agency. The process builds on a traditional cost-benefit analysis approach for making financial investment decisions, but is tailored to technology products and services. The

concept refines the definition of costs, suggests a way to quantify both tangible and intangible benefits, and recommends strong business justification as the basis for all technology decisions.

In the sections to follow, the process of portfolio assessment, investment planning and selection, and project development are discussed.

- Section II describes the portfolio planning process and how it differs from planning efforts in the past, the recommended planning structure, and the steps in the planning process.
- Section III describes IT portfolio assessment.
- Section IV summarizes the process for developing new investments.
- Section V briefly describes several assessment tools that can be used to conduct the baseline assessment as well as evaluating the merits of new investments.

IT Investment Planning

IT investment planning is a systematic process for linking each agency's investment in IT to its business strategies, objectives, programs, and processes. The planning process includes:

- Determining how well technology is currently meeting the business needs of the agency
- Identifying service gaps or technology opportunities that could improve agency performance
- Defining investments that will deliver desired business outcomes as well as customer satisfaction levels with the best value over the investment life cycle

At the heart of portfolio management lies a strong partnership between the business and technology domains of the agency. The business domain is the user of IT, while the technology domain is the supplier of technology services. The two domains must forge a partnership for portfolio planning and management to be effective. Figure 2 illustrates the continuous interaction between the business and technology domains in the portfolio planning process.

Four Dimensions of Technology Planning
As shown in Figure 2, the portfolio planning model involves four types of planning activities.

Figure 2: Dimensions of Portfolio Planning

Figure 2 Dimensions of Portfolio Planning
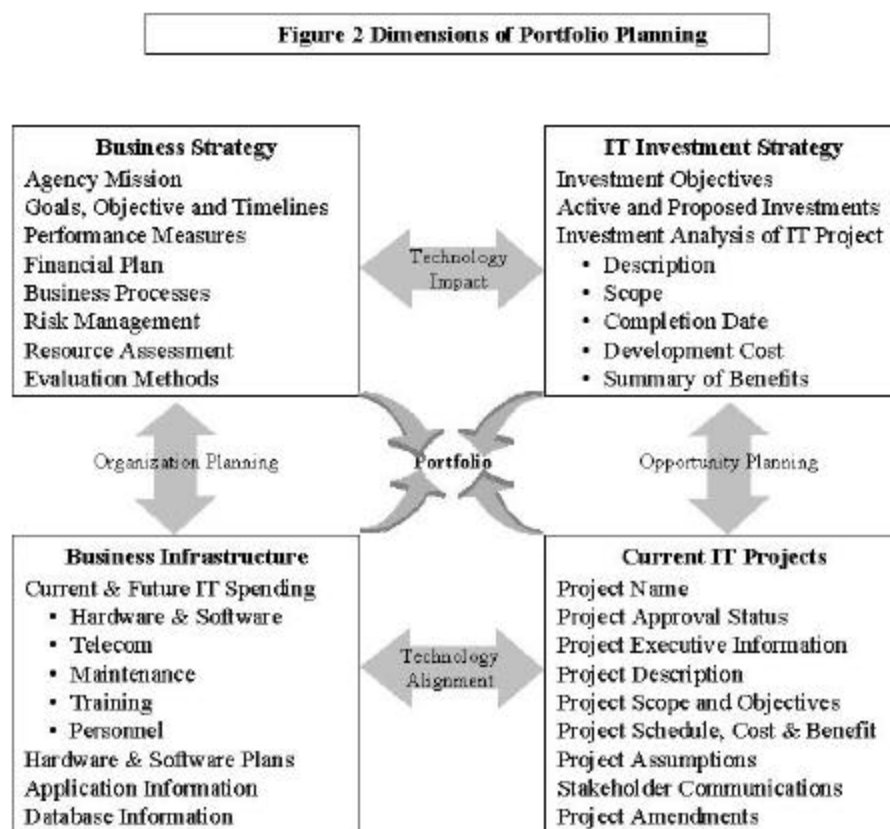
- **Organization Planning** — Begins with the agency's business strategy and defines the organizational structure and processes necessary to implement technology.
- **Technology Alignment** — Begins with the agency's business organization and processes and generates the information systems and applications that meet business needs.
- **Opportunity Planning** — Begins with the agency's existing technology inventory and defines current and future resources that may be deployed to change the business strategy and/or improve support for programs.
- **Technology Impact** — Begins with technology opportunities and generates changes to the business plan in terms of new strategies, products, services, customers, or customer interfaces.

Portfolio management differs from traditional planning models that typically focus on the automation of existing business processes (alignment planning). Portfolio management demonstrates how technology can enhance basic business strategies and methods. New problems, enhanced knowledge, advancing technology, and management perceptions drive plan changes and present new opportunities to improve business performance.

Portfolio Planning and IT Plans

The portfolio planning process replaces the development of agency strategic and tactical plans for IT. It structures executive decision-making in the selection of IT investments and feeds directly into the biennial budget process. Once an investment has been approved and resources allocated, implementation of the investment falls under the policies, standards, and guidelines that have been established for project management.

Portfolio planning will help ensure that IT will effectively support the accomplishment of the agency's business strategies. As shown in Figure 2, it can also play an important role in shaping those strategies. The planning process can identify opportunities for program improvements that may significantly affect future business goals, plans, and strategies. For example, in many agencies the identification of opportunities for the use of electronic funds transfer has enabled fundamental business process improvement. Similarly, geographic information system technology may offer a whole new paradigm for the organization and use of information in agencies whose missions revolve around geographic considerations.

How Portfolio Planning Differs from "Strategic" and "Tactical" Planning

Portfolio planning uses the portfolio as the foundation for a continuous planning process resulting in a technology investment plan that identifies the technology strategies, goals, and new projects required to meet the business needs of each agency.

The technology portfolio is a working document that is maintained and continually updated by the agency. The Investment section of the portfolio must be updated on an annual basis during the budget cycle for the biennium or the supplemental budget and is updated more frequently when an agency identifies new problems or opportunities requiring a technology investment.

All investment decisions are based on cost, benefit, and risk assessments or driven by federal and legislative mandates or other external mandates. Investment performance is measured regularly to ensure that all investments contribute to the overall strategic business plan of the agency.

Organizing the Planning Effort – An Integrated Planning Process

Strategic planning for IT should be integrated into each agency's overall business strategy planning process. As previously noted, a close partnership between program management and technical management is essential for effective portfolio planning. Each agency's senior technology manager, its Chief Information Officer, should be a member of its strategic planning work team.

The tasks that are traditionally associated with the strategic planning process provide useful vehicles for integrating business and technical strategies. Stakeholder analysis, for example, should include the needs and expectations of both users and suppliers of IT. Analyses of internal strengths and weaknesses should address the strengths and

weaknesses of the agency's technical infrastructure and its ability to respond to user needs. Similarly, the assessment of external opportunities and threats is an excellent channel for bringing technology issues, ranging from Year 2000 compliance issues to particularly promising new technologies, into the planning process.

If your agency anticipates using IT in conjunction with major business process improvement initiatives, has a relatively complex technical infrastructure, or has successfully adopted one of the formal, structured methodologies for technology planning, then it should establish a technical working group to support the overall strategic planning team. This working group should include agency executives, technical managers, and knowledgeable representatives of user management. The group charter should clearly state that its responsibility is to support the agency's overall strategic planning program, not develop an independent technical strategy.

Linking Technology Investments to the Agency's Strategic Business Plan and Budget

With the 1997-99 Biennium, the state has adopted a performance-based budgeting system that closely links each agency's strategic business plan with its budget. Agencies are required to directly tie their missions, goals, objectives, strategies, and performance measures to their financial plans.

Technology plays an important role in enabling each agency to accomplish its mission and program goals by supporting and enhancing basic business processes. Increasingly, technology is involved in every aspect of agency program operations. Therefore it is essential that technology planning be an integral part of the agency's overall performance-based business and budget plan. A major goal of portfolio-based IT management is to ensure the integration of business and technology visions.

Technology Planning Summary

Although the development of technology plans should be integrated within each agency's overall planning process, the following sequence of activities will help ensure that technological opportunities are identified and justified. The accomplishment of these steps should be the responsibility of the agency's strategic planning team, with support from its technical management and staff or a specialized work group of technical management and experienced technology users.

- **Assessing performance**. Assess the performance of the existing technology investments to establish a baseline. A technology portfolio measures how well existing investments are performing in terms of the business needs of the agency.
- **Identify service gaps or technology opportunities**. Planning is the process of analyzing business requirements, identifying problem areas, or identifying technology opportunities that will improve the business performance of the agency.

- **Identify alternatives.** Identify and assess alternative solutions for filling service gaps and/or take advantage of technology opportunities.

- **Implement investments and evaluate project/portfolio performance.** Implement the best solution and evaluate its performance to determine the success of the planning effort. Technically not a planning step, project implementation concludes the planning cycle. The evaluation provides the data for the next planning cycle. Performance data resulting from a systematic assessment process of existing and proposed investments is needed throughout the portfolio planning and management process in order to make informed planning, selection, and management decisions.

IT Portfolio Assessment

Agencies are required to conduct annual assessments of their IT portfolios. These assessments examine how well existing investments are meeting the business needs of the agency, identify problems with the management of existing investments, and suggest opportunities for improving agency performance through new technology investments.

Costs, Benefits and Risks — Key Factors in Portfolio Assessment

Considerations of costs, benefits and risks should be continually applied throughout the planning, selection, management, and evaluation phases of portfolio management. New or continuing portfolio investment decisions should be based on analyses of these factors.

- Costs (Recurring and Non-Recurring)
  - One-time costs, such as hardware and software, design and development cost
  - Ongoing costs such as salaries, software upgrades, training, supplies, and maintenance
  - Indirect costs such as initial productivity losses, network management, and data administration

- Benefits
  - Tangible benefits include those directly linked to the achievement of the agency's business strategy that can be explicitly quantified (e.g., cost reductions, productivity increases, processing time reductions, service quality improvements, etc.)
  - Intangible benefits include those directly linked to the achievement of the agency's business strategy that are difficult to quantify (e.g., greater data accuracy, improved data security, improved organizational knowledge, more efficient decision making, etc.)
- Risks
  - Strategic risk assessment ensures that proposed IT investments are aligned with the agency's strategic direction as set forth in the agency business plan
  - Financial risk is associated with the costs and duration of the development effort
  - Capability or project management risk is associated with the organization's capability of carrying out the changes required by the project, including management skill and experience

– Technology risk is associated with the technology that will be used to implement a proposed application or system
– Organizational impact or operational risk is associated with the degree and complexity of the changes to the business rules and processes

Agencies should assess their technology investments in terms of the performance of individual investments as well as the portfolio as a whole. A financial portfolio is measured by its overall gain or loss. Although individual investments may be profitable, if the overall results for the portfolio are below market benchmarks, the portfolio will not receive a positive rating. Market benchmarks in this context relate to at least the return on investment (ROI) being equal to or greater than original expectations. Successful projects are those that reach the expected outcome. Technology portfolios should be viewed in a similar fashion.

Portfolio-Level Assessment

Piecemeal assessment can result in the allocation of scarce resources to individual investments that are counter-productive in terms of the overall needs and expectations of the agency. Questions concerning interoperability, common architecture, or public information access cannot be resolved by assessing individual investments as separate entities. Viewed in isolation, an investment may appear to be justified; however, when considered within the context of other agency technology investments, it may prove to be redundant or inconsistent with the agency's overall technology strategy.
Therefore it is essential that each investment in the portfolio be assessed to ensure the investments support the strategic vision of the agency and are individually and collectively cost-effective. Portfolio assessment draws upon data about individual applications and projects, but it is not simply an aggregation of such data. It is necessary to assess each current and proposed investment in terms of its value in the context of the agency and state-level technology strategies.

Suggested below are some questions that will help you assess the value of the technology portfolio in achieving your agency's strategic vision.

- How well has the entire technology portfolio contributed to the achievement of the agency's mission, business goals, and objectives? Is technology producing cost-effective results?

- How well are technology investments being managed? Has the technology portfolio been reviewed to identify and reduce redundant and low value applications? Have legacy/old applications, data, and infrastructure been considered for integration into new systems or replacement? Have new opportunities for consolidation and sharing been pursued?

- Is the agency maximizing the business value and cost effectiveness of technology? Is the agency leveraging its technology resources across its entire operation? Can resources be shared or consolidated?

- To what extent do current technology investments employ a common architecture? What links need to be developed for interoperability and data sharing?
- What has been done to ensure appropriate public access to agency information and the ability to do business with the agency using technology resources?

One tool to assist agencies in measuring the effectiveness of their technology portfolios in achieving their business strategies is the "balanced scorecard" methodology. The balanced scorecard approach, which has been adapted to public agency settings by the U. S. General Accounting Office, helps to translate business strategies into technology objectives, measures, and performance targets. For a more complete discussion of the balanced scorecard in the public sector, please see the appendix.

Assessing Individual Investments

Each investment, application, or project in the portfolio should be assessed to determine how it is linked to the business plan. Benefits, costs, and risks should be measured. In addition to the information included in the portfolio itself, effective assessment may require that you review feasibility study reports, post-implementation studies, and program management reports.

Section V of this guide suggests some tools for conducting assessments of individual investments; however, you may use any combination of methodologies that together address:

- Cost/benefit ratios or other financial measures, such as ROI, that allow you to measure the investment against desired rates of return
- The investment's linkage to the business plan — agency strategies, goals and objectives, performance measures, and business process improvements
- Evidence that the project complies with state technology policies and standards
- Expected versus actual performance data measured against acceptable variation between expected and actual results
- A description of the risks associated with the investment and the success of the agency in controlling those risks — again measured against a level of acceptable performance

The assessment provides agency decision-makers with essential performance information about each individual investment and the portfolio as a whole. The process should validate most investments in the portfolio, but it may identify some for immediate or future elimination. Other investments may need active monitoring or even reassessment using a more detailed or rigorous assessment tool. The results of the assessments should be hyper-linked and Section 4 of the portfolio should be appropriately updated.

Developing New Investment Proposals

IT portfolio management is a continuous and dynamic process. Figure 3 illustrates how new agency investments are incorporated into the portfolio. Each investment should be

evaluated and supported with sufficient justifying evidence on which to base a selection decision.

An agency's decision to approve a new investment should be based on:
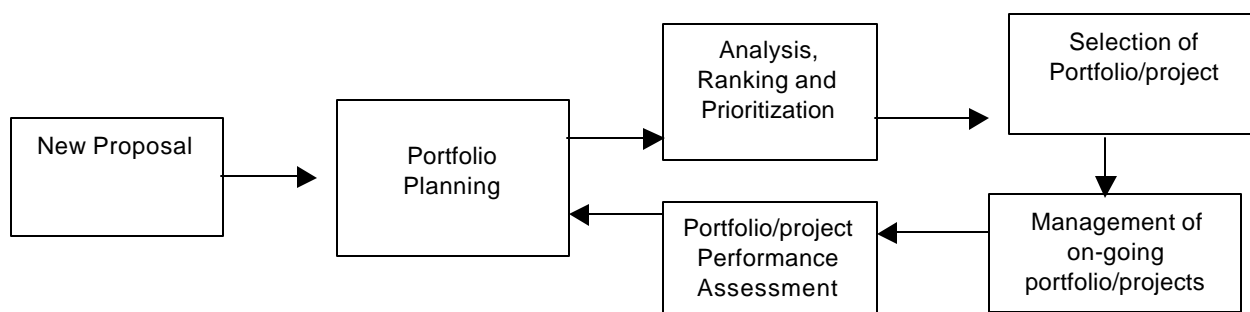
- The relative benefits, costs and risks of the project in comparison to all other proposals

- The strength of the project's linkage to the agency's strategic business plan

- Adaptability to future business needs and priorities

- Completion of the project's development cycle (or stand-alone increment) within two years

The contribution the proposed technology will make to the agency's technical infrastructure, including but not limited to analysis of the following:

- Use of existing assets including hardware, software, tools, and programs

- Ability to capture, analyze, maintain, and share data

- Robustness of the proposed solution and the estimated life expectancy of any developed system

- Reliability and ease of use of the user interface

- The reusability of any programs, purchased software, or tools

- Interoperability and scalability of any purchased or developed components

- The use of industry accepted standards for connectivity and open systems

- Ease of maintenance

In general, high risk (as identified in the IT Portfolio Structure and Content Standards, Appendix A) and multi-biennia investments are subject to Department of Information Services (DIS) and ISB prior approvals. Once an investment has been identified by the agency, it should be included in the Planned Projects/Investments section of the portfolio and ranked against other possible investments.

Figure 3: Selecting New Investments

```
┌──────────────┐         ┌──────────────┐      ┌──────────────┐      ┌──────────────┐
│              │         │              │      │  Analysis,   │      │ Selection of │
│ New Proposal │────────▶│  Portfolio   │─────▶│  Ranking and │─────▶│Portfolio/    │
│              │         │  Planning    │      │Prioritization│      │  project     │
└──────────────┘         │              │      └──────────────┘      └──────────────┘
                         │              │                                    │
                         │              │      ┌──────────────┐      ┌──────────────┐
                         │              │      │Portfolio/    │      │Management of │
                         │              │◀─────│project       │◀─────│on-going      │
                         │              │      │Performance   │      │portfolio/    │
                         └──────────────┘      │Assessment    │      │projects      │
                                               └──────────────┘      └──────────────┘
```

The process of conducting the annual portfolio assessment will identify gaps in the agency's technical infrastructure and suggest opportunities for improving agency performance through new technology investments. Once a problem or opportunity has been identified, you can begin the process of identifying and prioritizing possible new investments — a systematic and rigorous process of compiling data, identifying alternative solutions and analyzing the associated costs, benefits and risks of each alternative.

Responsibility for Selecting Investments

Primary responsibility for selecting IT investments lies with the head of each agency. The identification and assessment of technology investments in support of this executive responsibility may be overseen by the agency's strategic planning committee or by a separate IT portfolio planning team. In either case, detailed program and technology input should be drawn from both user and technology staff. The process of identifying and documenting technology investments is essentially similar to the project planning and justification stages in the state's established technology management process. As in the past, development follows the normal steps in the technology project cycle. At each succeeding step in the process, agency management has more information on which to make decisions to continue or curtail further investment.

Documenting Proposed Investments

Summary information about each proposed new investment must be included in the Planned Projects/Investments section of the portfolio investment plan. The format for the portfolio is specified in a separate document entitled, "IT Portfolio Structure and Content Standards." This summary information should be based on the best information about the investment that is currently available to the agency.

If a proposed investment requires DIS or ISB approval, the agency should be prepared to supplement the information provided in the portfolio with whatever additional evidence it thinks appropriate to demonstrate the merits of the investment. Similarly, if the investment requires a budget action, the agency should be prepared to provide whatever additional information is specified in the current budget instructions.

Agencies should retain documents — such as business process improvement studies, requirement analyses, or feasibility study reports — used in preparing the investment analysis for possible review or audit by DIS and/or ISB.

Analyzing and Justifying Proposed Investments

Each agency is responsible for analyzing and justifying its proposed IT investments and providing evidence that each will bring an appropriate return from the expenditure of scarce public resources and further agency and state-level priorities. In most cases, this analysis and justification should include:

- IT Investment Definition — A high-level analysis that addresses the business needs of the agency and the proposed scope, schedule, and cost of the investment
- Comparative Assessment of IT Investment Alternatives — Ranks alternatives in terms of agency priorities, as well as relative costs, benefits and risks
- Feasibility Study — Provides an in-depth analysis of the desired results of investments and examines the technical requirements of the project, the relative costs, benefits and risks of each technical alternative, and lays out a project implementation plan

The information developed through the investment definition and comparative analysis steps will normally be sufficient for executive decision-making and, if required, DIS or ISB review and approval of proposed IT investments. In some cases, agencies may be asked to provide supplemental documentation to support control agency review and approval.

Investment definition, comparative assessment, and feasibility studies are discussed in the remainder of this section.

Investment Definition

The investment definition establishes the initial expectation of scope, schedule, and cost for a possible IT investment. The analysis should follow from a general design and requirements analysis and include:

- Background Statement and a discussion of the reasons for the investment
  - Business environment
  - Business needs
  - Business opportunities
  - Business service goals
  - Statutory requirements

- Objectives — the primary outcomes of the investment
  - Problems that will be solved and/or opportunities for business process improvement
  - Service delivery enhancements
  - Response to statutory requirements

- Project Impacts — other agencies or entities affected by the investment
  - Interagency
  - Intra-agency
  - Programs/Subprograms
  - Agency customers (i.e., clients, constituents, taxpayers, etc.)

- Organizational Effects — describe (as applicable) how implementation of the investment may affect the agency
  - Impact on work processes
  - Need for training
  - Changes in job content
  - Changes in the organizational structure

- Description of the proposed solutions chosen and of the alternative solutions considered but not chosen
  - Positive aspects of the chosen solution, that is, factors that ultimately made the approach the most desirable
  - Shortcomings of the considered alternatives that made them ultimately less satisfactory in the project analysis under consideration

- Cost Projections
  An estimate of the total project cost for each phase of the investment from definition through implementation. You need to be able to document the methodology used to develop the estimate

- Cost-Benefit Summary
  An initial cost-benefit analysis of the proposed investment

- Estimated Time Frame
  An estimation of the time required to implement the investment

- Conformity with Agency Plans
An analysis of how the proposed investment supports the agency's strategic business plan and the relationship between the investment and other current and proposed technology investments in the technology portfolio.

- Project Management and Organization
  - Determination of the project management approach for the investment
  - Roles and responsibilities

- Decision making process
- Management qualifications
- Quality assurance/oversight
- Risk management
- Procurement strategy
- Measures of success

Fiscal requirements

The estimated budget for the investment, including funding sources and spending plan.

Comparative Assessment

The purposes of the comparative assessment of proposed IT investments are to establish priorities among investment alternatives and to ensure that each investment is viewed in light of its impact on other current and proposed investments. The various investment definitions and the Project and Infrastructure sections of the agency's portfolio provide data for the assessment. Typical questions that should be addressed in conjunction with the assessment include:

- What are the relationships between each proposed investment and other active and proposed investments?

- To what extent does each investment enhance or restrict the value of other investments?

- Is the success of any investment contingent upon the successful implementation of other investments or completion of ongoing projects?

- What criteria should be used in establishing the priority of agency IT investments and what should be the relative weight of each criterion?

- How well does each proposed investment satisfy each criterion? What is its total score?

- How should proposed investments be ranked for budgeting and resource allocation?

Agencies may establish any comparative assessment methodology that they feel is appropriate to support executive decision-making. The methodology should be systematic and fully documented, and the results of the assessment must be hyper-linked to, or referenced by the agency's portfolio.

Feasibility Study

A feasibility study is a rigorous examination and documentation of the costs, benefits and risks of an IT project and provides a transition from investment analysis to project management. The study builds on analyses and information already collected during the definition step of the portfolio management process. The scope of the study should be commensurate with the nature, complexity, risk, and expected cost of the project. Only very limited projects do not normally necessitate a feasibility study. These include projects of less than six months duration, that require minimal changes in the agency's business

processes, or that respond to problems or opportunities with a straightforward solution based on off-the-shelf products.

The feasibility study should document:

- The problem or opportunity in terms of the effect on the agency's mission and programs
- The organizational, managerial, and technical environment within which a response to the problem or opportunity will be implemented
- Specific service level and/or financial objectives to justify the investment
- Functional requirements
- The identification and evaluation of alternative courses of action for each established objective
- Economic analysis (i.e., cost-benefit analysis) for each alternative which meets the established objectives and functional requirements
- Risk analysis for each alternative
- Risk mitigation plan for the selected alternative
- The selection of the alternative that is the best response to the problem or opportunity
- Project work plan for implementation of the proposed action

You may access the DIS feasibility study guidelines and cost benefit analysis tools at:
http://www.wa.gov/DIS/portfolio

Tools for Making Technology Investment Decisions

When using any assessment tool, keep in mind that assessments are dependent upon both soft and hard data. The responsibility of the agency is to provide a body of evidence in support of each proposed technology investment that will persuasively demonstrate that the investment is in fact a sound use of scarce public resources. Quantification of data to score or rank projects should be done whenever feasible; however, many aspects of the assessment process, such as the determination of benefits, will require an examination of both tangible and intangible benefits.

Methods that can be used for assessing, ranking, and selecting new investments are listed below and further detailed in the appendix.

An Information Economics Model

Information economics helps decision-makers determine the true value of IT and is based upon the concepts of value and two-domain analysis. Value is the contribution technology makes to enable the success of the business domain. The two-domain analysis separates business and technology to determine the impact of a technology investment on each domain. (Each of the impact measures listed below is defined in the appendix.)

Business domain impact measures:

- Return on Investment (ROI)
- Strategic match (SM)
- Competitive advantage (CA)
- Management information support (MI)
- Legislative implementation (LI)
- Organizational risk (OR)

Technology domain impact measures:
- Strategic technology architecture alignment (SA)
- Definitional uncertainty risk (DU)
- Technical uncertainty risk (TU)
- Information system infrastructure risk (IR)

To evaluate a proposed project, the planning team and/or senior managers assign scores for each factor based on its value or risk to the agency and a weight reflecting the factor's relative importance to the agency. For a more detailed explanation, please see the appendix.

Federal Assessment Model

The federal assessment model provides an assessment method derived from the information economics model. This model weighs costs, benefits and risks for proposed projects and scores them based upon five factors: linkage to the business plan, mission effectiveness, organizational impact, risk and cost-benefit ratio. By scoring all proposed new investments with this tool, decision-makers can readily see which projects appear to have the greatest value to the agency. The appendix provides a description of the scoring technique and a hypothetical example using the method.

Balanced Scorecard

As noted above, the balanced scorecard is a results-oriented planning and assessment approach that integrates business, technology, and financial planning processes. The balanced scorecard translates business strategies into technology objectives, measures, and performance targets. Unlike other methods that focus solely on financial perspectives, the balanced scorecard uses three additional perspectives: the customer, internal business processes, and organizational learning and growth. Together, these perspectives give a comprehensive view of how technology is performing in relation to the agency's vision and business strategy. Proposed new initiatives or projects also are assessed to determine which ones have the greatest potential for contributing to the achievement of agency objectives.

To apply the balanced scorecard approach, a portfolio steering committee links specific business strategies to desired technology results. Based on the agency vision and strategy, the steering committee sets objectives by identifying success measures. Then

specific measures are developed to gauge achievement of the objectives in relation to the customer, learning and growth, internal business processes and financial areas. Balanced scorecard matrices are provided in the appendix. Using the results obtained from using the balanced scorecard, decision-makers can readily see the strengths and gaps in their technology portfolio.

Other Tools
- Cost-Benefit Analysis

Cost-benefit analysis is a systematic quantitative method of assessing the desirability of projects or policies. A standard source for governmental agencies is the federal Office of Management and Budget Circular A-94 which provides an excellent guide to cost benefit analysis.

The following list of typical costs and benefits associated with technology projects may be used. The list of benefits includes both the tangible and intangible benefits of a project.

Costs	Benefits and Opportunities
Non-recurring • hardware • software • network hardware and software • software and data conversion • site preparation • installation • initial loss of productivity Recurring • hardware maintenance • software maintenance • systems maintenance • data administration • software development • communications • facilities (rent)	• Higher productivity, increased capacity • Reduced cost of rework, scrap, failure • Reduced cost of technology operations and support costs • Reduced cost of business operations • Reduced errors • Improved image • Reduced material handling costs • Reduced energy costs • Better resource utilization • Better public service • More timely information • Improved organizational planning • Increased organizational flexibility • Availability of new, better or more information • Ability to investigate an increased number of alternatives • Faster decision-making • Promotion of organizational learning and understanding • Better network and system interoperability • Better information connectivity • Improved IT response time to user requests • Expandability of standards-based systems • Greater access to agency information • Legislative and regulatory compliance

Costs	Benefits and Opportunities
• power and cooling	
• training	

Online Excel spreadsheets are available at
http://www.wa.gov/dis/portfolio/CBAmodel_0003011.xls and guide the preparation of
information and provide the calculations needed for a valid cost-benefit analysis.

Risk Assessment Tools

Risk relates to the probability of success or failure of an action. Portfolio management
focuses on five areas of risks to be considered in making IT investment decisions. These
include:

- Strategic Risk — The degree to which the proposed investment will align with the
  agency's strategic direction and integrate into the existing business.

- Financial Risk — The probability that the agency will be able to secure funding for the
  entire project life cycle and that the project will deliver on the proposed financial
  benefits.

- Capability or Project Management Risk — The probability that the agency has the
  project management capability needed to successfully implement the investment,
  including a realistic timeframe, sufficient resources, necessary skill levels, and a sound
  business approach.

- Technology Risk — The degree to which the investment must rely on new, untested, or
  outdated technologies, including hardware, software, and networks.

- Organizational Impact or Operational Risk — The amount of change needed within the
  agency to benefit from the new investment, as well as the effort required to continue
  program operations once the investment is implemented.

Assessing risk for a proposed new investment must be based upon the best information
available at the time of the assessment and the judgement of the project planners. During
the early stages of investment analysis, sufficient information for a thorough risk
assessment may not be available. Therefore, risk assessment should be repeated at
major milestones in the investment planning and project development sequence to assure
that risks are within reasonable limits and an appropriate risk mitigation plan has been
developed.

Many risk assessment methods employ survey instruments that ask affected program,
financial, and technology managers, and system users to independently respond to
questions designed to measure risk in the five areas. By involving a cross section of
affected parties a broad perspective of potential risk is obtained. Several of these tools
are referenced below:

The California Risk Assessment Model

The Risk Assessment Model used by the State of California for evaluating the risk of proposed IT projects. Is available at http://www.doit.ca.gov/SIMM/.

Measuring the Success of the Portfolio Management Approach

Benchmarks that measure the successful implementation of portfolio management and establish the positive impacts expected from portfolio management approaches include the following:

- All required elements are included in the portfolio document.
    - Use checklist to measure level of compliance

- Technology investments are demonstrably linked with the Business Strategic Plan
    - Develop questionnaire to specify how projects support objectives and strategies

- The agency assesses, manages, and mitigates risk using proven risk identification and mitigation tools
    - Evaluate by percentage of agency projects utilizing continuous risk management tools, track trend of issues resolved that presented need for corrective action

- The agency uses appropriate project management techniques
    - Develop questionnaire to evaluate usage, specify how Capability
    - Maturity Model level 2 Key Process Areas are satisfied

- The agency executive(s) support the portfolio because they have become more involved in IT policy and investment decisions
    - Measures can be changes in amount of time executives spend with IT managers, changes in dollars committed to improve processes

- The agency investment policy is demonstrably improved as a result of portfolio analysis
    - Develop questionnaire, identify what savings have been achieved as a result of the analysis

- The amount of defect densities, schedule slips, and cost overruns have been significantly reduced, as well as the number, size, and frequency of IT project failures, since the portfolio requirements have been implemented
    - Measure change in all areas over time

Related Policies and Standards

IT Portfolio Management Policy
IT Portfolio Management Standards

[IT Planning Policy](#)

Maintenance

Technological advances and changes in the business requirements of agencies will necessitate periodic revisions to policies, standards, and guidelines. The Department of Information Services is responsible for routine maintenance of these to keep them current. Major policy changes will require the approval of the ISB.

Definitions

An **investment** is a specific piece of hardware/peripherals or a software application developed at agency expense or acquired from vendors, or any combination of these events, that serves current and future needs of the agency.

A **project** is an investment in progress (developing or unfolding) that has a specific start and finish date.

A **planned or proposed investment** entails the acquisition of new capability that is identified in general terms, but not yet funded or approved by the authorizing entities.

Generally, any project, investment, acquisition, or asset ranking high in any risk matrix category (See IT Portfolio Management Standards, Appendix A) should be included in an agency portfolio. Similarly, any such project, investment, acquisition, or asset with a number of medium rankings should also be considered for inclusion.

Appendix: Assessment Tools

Information Economics

Information economics provides a means to analyze and select technology investments. Information economics examines investments from both the perspectives of the business and technology domains. Examined in this method include the following:

Business domain factors:

- Return on investment (ROI) assesses the costs and benefits of a technology investment on other departments of the agency
- Strategic match (SM) assesses the degree to which the proposed project corresponds to established agency strategic goals. Projects that are an essential part of the corporate strategy receive a higher score than those that are not
- Competitive advantage (CA) assesses the degree to which projects create new business opportunities, facilitate business transformation, and improve agency's reputation or image
- Management information (MI) assesses a project's contribution to management's need for information about core activities that involve the direct realization of the mission versus support activities
- Legislative implementation (LI) assesses the degree to which the project implements legislation, executive orders and regulations
- Organizational risk (OR) assesses the degree to which an information system project depends on new or untested corporate skill, management capabilities and experience. Organizational risk focuses on the extent to which the organization is capable of carrying out the changes required by the project from both user and business perspectives.

Technology domain factors:

- Strategic architecture (SA) assesses the degree to which the proposed project fits into the overall information systems direction and conforms to open-systems standards
- Definitional uncertainty (DU) is a negatively weighted factor that assesses the degree of specificity of the user objectives, as communicated to the information systems project staff. Large and complex projects that entail extensive software development or require many years to deliver have higher risks compared to those projects segmented into modules with near-term objectives.
- Technical uncertainty (TU) assesses a project's dependence on new or untried technologies

Infrastructure risk (IR) assesses the degree to which the entire technology organization is both required to support the project, and prepared to do so. It assesses the environment,

such as data administration, communications and distributed systems. A project requiring the support of many functional areas is inherently more complex and difficult to manage.

To evaluate each project, the portfolio planning team assigns a score ranging from zero to five for each domain factor and a corresponding weighting factor of zero to ten. The sum of the value factor scores multiplied by the factor weights constitutes the project value. The sum of the risk factor scores multiplied by the factor weights constitutes the project risks. In the example below, the total value score is 66. (ROI + SM + CA + MI + LI + OR = value). Risk score is 27. (SA + DU + TU + IR = risk)

	Business Domain						Technology Domain				Project Score	
Factor	ROI	SM	CA	MI	LI	OR	SA	DU	TU	IR	Value	Risk
Score	4	2	0	4	0	3	4	2	1	3		
Weight	10	5	0	2	1	5	2	2	2	2	66	27

In this hypothetical example, the planning team placed the highest weight, 10, on ROI; and 5, or half the importance of ROI, on SM. They also rated the project high (4) on ROI because the project projected high labor savings. However on strategic match, the team assigned a score of 2 because it did not contribute significantly to the organizational goals. With respect to organizational risk, the team assigned a score of 3 because the operating division did not make adequate plans to integrate the new project into its operations. For each factor, the planning team sets a weight and assigns a score. In this hypothetical example, the total value score is 66 and risk score is 27. Applying this method to all proposed new projects, selection would be based on those receiving the highest overall value and risk scores.

Federal Assessment Model
The federal model weighs costs, benefits and risks for proposed projects and scores them based on five categories: linkage to the business plan, mission effectiveness, organizational impact, risk, and benefit cost ratio. A total of 100 points are possible in the example. A range of points can be assigned depending on the relative value of the project in relationship to the category. In the example below, "link to business plan" is assigned a total of 25 points. Each project is scored from 0-25 depending upon the judgment of the portfolio steering committee (or other group of senior managers) rating proposed new investments or assessing existing ones.

Definitions of the categories and scoring criteria are provided below.

Example of Ranking List of Technology Investments

Project name	Estimated project cost	Link to business plan 25 pts.	Mission effective-ness 20 pts.	Organization Impact 10 pts.	Risk 20 pts.	Benefit-Cost Ratio 25 pts.	Total Score 100 pts.
Proj A	800K	23	18	8	18	20	87
Proj B	620K	23	15	9	16	15	77
Proj C	582K	18	14	7	14	15	68
Proj D	500K	16	16	7	16	10	65
Proj E	1698K	15	18	6	9	15	63

Scoring Criteria

Each factor is assigned a maximum number of points to be awarded to projects that most closely meet the criteria. Scoring can vary from zero to the maximum allowed for each factor. Some of the examples give specific guidance in the allocation for points.

Linkage to Business Plan *(*25 pts.) The strength of linkage of the investment to the business plan. Scoring is based on documentation of need for the investment.

Business Model (7 pts. max.) Assess the degree of alignment with the business plan/priorities. Example scores:

Zero pts.: project does not support agency products/services or processes

1-4 pts.: project is specifically mentioned in business plan and supports agency products/services or processes

5-7 pts.: project is specifically mentioned in business plan and supports products/services or processes identified in the plan and the project has been coordinated with all organizational entities impacted by the project

Level of Interest (12 pts. max.) Assess the level of interest by agency senior managers, ISB and/or the legislature. Example scores:
Zero pts.: no expressed support for this project

12 pts.: strongly supported by senior managers, agency head, ISB and/or legislature

Business Process Redesign (6 pts. max.) Assess the degree the project enables the organization to do business in a better way. Example scores:

Zero pts.: automates an existing business process with little improvement of the process
6 pts.: enables significant improvement in way business is conducted.

Mission Effectiveness (20 pts.) Measure the impact of the system on both external and internal customers. Measure the project's ability to improve the performance of support or operational programs. Quantify the improvement if possible.

Improve Internal Program Services (10 pts. max.) Assess the expected improvement in service to internal customers. Example scores:

Zero pts.: does not appear to solve a problem defined by an internal customer. Little improvement in important customer service criteria, such as timeliness, quality, or availability is expected.

10 pts.: significant improvement expected in areas such as timeliness, quality or availability, and improvement is quantified. Improvement also addresses an important problem or area of service improvement defined by the customer.

Improved Service to the Public (10 pts. max.) Assess the expected improvement in service to the public. Example scores:

Zero pts.: project appears to provide little or no direct improvement in service to the public. Project makes a small improvement in timeliness, quality, or availability, but no documented need for such improvement is quantified.

10 pts.: project significantly improves service to the public in a mission where need is demonstrated or provides a new type of service to meet changing demands. Improvement is quantified.

Organizational Impact (10 pts.) Measures the impact on technology personnel.

Personnel and Training (3 pts. max.) Assess the impact of the system on the knowledge, skill, and training of technology personnel. Example scores:

Zero pts.: project likely to require significant new skills to operate and support and project does not appear to mitigate this impact through appropriate training, or other personnel related remedies.

3 pts.: project is an improvement to an existing system and will require relatively little new skill and/or knowledge to operate or support. If project is new, it will introduce valuable new skills and knowledge to the organization and the project will mitigate any adverse impact through appropriate training, or other personnel related remedies.

Scope of Beneficiaries (4 pts. max.) Assess a higher score, the broader the scope of beneficiaries. Example scores:
Zero pts.: limited number of beneficiaries. Project will be used by only one office in the agency. Not a cross-functional system.

4 pts.: project is cross-functional and serves a number of offices, areas, and/or districts. Large number of organizational units will use project. Project will be used by the public.

Quality of Work Life (3 pts. max.) Measures the improvement in quality of work life expected. Example scores:

Zero pts.: little if any positive impact on the quality of work life. Project may increase work required.

3 pts.: positive contribution to the quality of work life. For example, project allows job to be done much faster and job satisfaction is expected to increase.

Risk (20 pts.) Measures the risk resulting from uncertainty, with a project that is totally lacking in risk scored 20. (The more risk carried by the project, the lower the risk score.)

Schedule Risk (4 pts. max.) Evaluate the probability this project can be completed on schedule. Score from 0-4 pts. based on where the project best fits on a scale from very risky to low risk. Example scores:

Zero pts.: very risky. Execution of project is likely to slip; acquisition strategy indicates contract may not be awarded on time to meet schedule or obligate budget year dollars. Project is understaffed and/or inexperienced and project is complex. Accelerated project schedule was imposed rather than developed from project planning.

4 pts.: low risk. Execution of project is not likely to slip; acquisition strategy should result in timely contract award such that funds can be obligated as planned. Adequate project staff is available and has requisite experience to execute the project; project complexity is documented. Project schedule has not been accelerated to meet artificial deadlines.

Cost Sensitivity (4 pts. max.) Evaluate the sensitivity or quality of the cost estimates. Example scores:
Zero pts.: very risky. Project is complex and cost estimates appear to require additional refinement. Software development is required and represents more than 50 percent of the predicted cost.
4 pts.: low risk. Cost estimates are well supported. Little software development required or a software cost estimating technique has been used to produce a reasonably reliable cost estimate.

Technical Risk (4 pts. max.) Evaluate the risk to complete the system from a technical point of view. Example scores:

Zero pts.: very risky. Hardware and/or software solution does not conform to agency's technical architecture and/or there is little or no experience with this technology in the

agency. Hardware, software, or support is not now available commercially and requires development specifically for the agency.

4 pts.: low risk. Planned hardware and software conform to organization's technical architecture and there is successful experience in using this technology in the agency. Hardware, software, and support are commercially available and do not have to be developed for use in the agency.

Organizational Risk (4 pts. max.) Assess the risk that the proposed system will fail due to organizational disruption. Example scores:

Zero points: very risky. Project implementation requires significant organizational change, process redesign, and/or people's jobs to be done differently and the project is not proactively seeking to mitigate this risk.

4 pts.: low risk. System has little impact on the organization or the project is mitigating this risk through training and/or investment in a business process redesign effort that builds commitment to the project.

Risk of Not Doing It (4 pts. max.) Assess the risk to the organization of not proceeding with project. Example scores:

Zero pts.: low risk. Project is incremental improvement to existing system. Impact of this project can be achieved by other means.
4 pts.: very risky. The project is important to provide future opportunities for cost savings and/or improved customer service. If system is not built or delayed for a year or more, the agency will probably fail to meet customer demands in the near future.

Benefit-Cost Ratio (25 pts.) Measures the value of the system in dollar terms. This ratio is developed using standard benefit-cost methods. Alternative methods to benefit-cost analysis include return of investment or net present value calculations. If using benefit-cost analysis, the higher the ratio, the better the score.

• Zero pts.	benefit-cost ratio less than one (costs exceed the benefits)
• 1-5 pts.	low benefit-cost ratio
• 5-20 pts.	medium benefit-cost ratio
• 20-25 pts.	high benefit-cost

Balanced Scorecard

The balanced scorecard is a result-oriented planning and assessment approach that integrates the business, technology and financial planning processes. The balanced scorecard translates business strategies into technology objectives, measures and performance targets from the perspectives of the financial, internal business processes,

customer, and learning and growth interests of the agency. Proposed new investments are assessed to determine which have the greatest value for achieving the objectives.

The balanced scorecard addresses how well technology is:
- Achieving the strategic needs of the agency as a whole
- Satisfying the needs of individual customers with technology products and services
- Delivering quality products and services (effectiveness and efficiency of technology organization)
- Accomplishing ongoing technology innovation and learning

Objectives and corresponding performance measures are developed from four perspectives. By examining the resulting performance data, decision-makers can determine which projects have the greatest value for the agency.

Achieving the Strategic Needs of the Agency as a Whole
In the chart below the performance of the technology portfolio is assessed for its contribution to the agency's strategic business plan.

Objectives	Sample Measures
Linkage to business mission, goals, objectives	• percent mission improvements (costs, time, quality, quantity) attributable to technology solutions and services • percent planned technology benefits projected vs. realized
Portfolio analysis and management	• percent technology portfolio assessed and disposed • percent applications retirement plan achieved • percent reusability of core applications • percent new technology investments vs. total technology spending
Financial and investment performance	• return on investment, net present value • technology budget as percentage of operational budget compared to other agencies or the state as a whole
Technology resource use	• percent shared/consolidated resources • percent cross-unit shared databases and applications • percent hardware/software with interoperability capabilities

Agencies using these approaches believe consistency requires choosing an approach and conforming to it over time.

Satisfying the Needs of Customers
This perspective is designed to assess the impact technology has on customer satisfaction. Some questions that can help to define the objectives include:
- How well are the business and technology domains integrated in the portfolio planning and selection process?
- Are customers satisfied with technology products and services?
- Are technology resources supporting major process improvement efforts?

Objectives	Sample Measures
Customer/technology partnership	• percent projects using integrated project teams • percent joint technology customer/supplier service level agreements
Customer satisfaction	• percent customers satisfied with technology product delivery • percent customers satisfied with technology problem resolution • percent customers satisfied with technology maintenance and support • percent customers satisfied with technology training • percent products launched on time • percent service level agreements met
Business process improvement	• percent technology solutions supporting process improvement projects • percent users covered by training to use new technology solutions • percent new users able to use applications unaided after initial training

Delivering Quality Products

This perspective is designed to assess the ability of the technology organization to deliver quality products and services. Some questions to consider in developing the objectives:

- Are quality products delivered within general industry standards?
- Are quality products being delivered using acceptable methods and tools?
- Is our infrastructure providing reliable support for business needs?
- Is the enterprise architecture being maintained and sustained?

Objectives	Sample Measures
Applications, development and maintenance	• percent decrease in application software failures, problems • average time to resolve critical defects • cycle time for development
Project performance	• percent projects on time, on budget • percent projects meeting functionality requirements • percent projects using standard methodology for systems analysis and design
Infrastructure availability	• percent computer availability • percent communications availability • percent applications availability • on-line system availability
Architecture standards compliance	• number of variations from standards detected by review and audit per year • percent increase in systems using architecture • percent staff trained in relevant standards

Innovation and Learning

This perspective assesses the technology organization's ability to deliver quality results. Some questions to ask in developing the objectives:

- Do we have the right skills and qualified staff to ensure quality results?
- Are we tracking the development of new technology important to our business needs?
- Are we using recognized approaches and methods for building and managing technology projects?
- Are we providing our staff the proper tools, training, and incentives to perform their tasks?

Objectives	Sample Measures
Workforce competency and development	• percent staff trained in use of new technologies • percent staff professionally certified • percent technology management staff trained in management skills • percent technology budget allocated to training and staff development
Advanced technology use	• percent employees skilled in advanced technology applications • number of dollars available to support advanced technology skill development
Methodology currency	• currency of application development methods in use • percent employees skilled in advanced application development methods • percent projects developed using recognized methods and tools
Employee satisfaction and retention	• percent employee satisfaction with the capability of the existing technical and operating environment to support mission • percent employee turnover by function